CLAIMS

1. A mounted board comprising a circuit board and a semiconductor package holding semiconductor elements on a carrier substrate, wherein said semiconductor package is connected to said circuit board with solder balls, and spaces between solder connected parts are filled with an underfilling material which consists essentially of a one-pack type thermosetting urethane composition.

2. The mounted board according to claim 1, wherein said one-pack type thermosetting urethane composition comprises:

a urethane prepolymer having a terminal isocyanate group, which is obtained by reacting a polyol with an excessive amount of a polyisocyanate, and

a fine powder-coated curing agent comprising a curing agent which is in a solid state at room temperature and surface active sites of which are covered with a fine powder.

3. A method for producing a mounted board which comprises a circuit board and a semiconductor package holding semiconductor elements on a carrier substrate, wherein said semiconductor package is connected to said circuit board with solder balls, and spaces between solder connected parts are filled with an underfilling material which consists essentially of a one-pack type thermosetting urethane composition, the method comprising the steps of:

connecting said semiconductor board to said circuit board with said solder balls,

then filling the spaces between solder connected parts with said underfilling material, and

curing said underfilling material to seal said mounted board.

4. A method for producing a mounted board which comprises a circuit board and a semiconductor package holding semiconductor elements on a carrier substrate, wherein said semiconductor package is connected to said circuit board with solder balls, and spaces between solder connected parts are filled with an underfilling material which consists essentially of a one-pack type thermosetting urethane composition, the method comprising the steps of:

applying the surface of said circuit board with said underfilling material,

connecting said semiconductor board to said circuit board with said solder balls,

and curing said underfilling material to seal said mounted board.

5. An underfilling material for a semiconductor package holding semiconductor elements on a carrier substrate mounted on a circuit board, consisting essentially of a one-pack type thermosetting urethane composition.

6. The underfilling material according to claim 5, wherein said one-pack type thermosetting urethane composition comprises:

a urethane prepolymer having a terminal isocyanate group, which is obtained by reacting a polyol with an excessive amount of a polyisocyanate, and

a fine powder-coated curing agent comprising a curing agent which is in a solid state at room temperature and surface active

sites of which are covered with a fine powder.

7. The underfilling material according to claim 6, wherein said urethane prepolymer is a mixture of a urethane prepolymer having a terminal isocyanate group comprising a hydrocarbon polyol as a polyl and a urethane prepolymer having a terminal isocyanate group comprising a polyoxyalkylene polyol in a weight ratio of 9:1 to 2:8.

8. The underfilling material according to claim 6, wherein said curing agent which is in a solid state at room temperature is at least one curing agent selected from the group consisting of imidazole compounds, imidazoline compounds, amine compounds, guanidine compounds, acid anhydrides, dibasic carboxylic acid dihydrazide, guanamines, melamine and amine adducts.

9. The underfilling material according to claim 6, wherein said fine powder is one material selected from the group consisting of titanium oxide, calcium carbonate, clay, silica, zirconia, carbon, alumina, talc, polyvinyl chloride, acrylic resins, polystyrene and polyethylene.

10. The underfilling material according to claim 6, wherein said one-pack type thermosetting urethane composition further comprises at least one additive selected from the group consisting of epoxy resins, organosilicone compounds and dehydrants.

11. A method for repairing a mounted board of claim 1 comprising the steps of:

partly heating at least one of said semiconductor package and said circuit board to a temperature in the range between 180°C and 350°C,

melting said cured underfilling material and optionally

said solder,

removing said semiconductor package from said circuit board and

mounting said semiconductor package or a new semiconductor package on said circuit board.